Introduction to Medical Psychology
Lecture 1: Introduction to Course

Richard Veale

Graduate School of Medicine
Kyoto University

https://youtu.be/BN9rke8eUOg

Lecture video at above link.

Contact Me

e-mail: veale.ilas.healthpsych@gmail.com

My Offices (please tell me before you come):
- Medical Campus -- E Building 109 (1st floor)
- Medical Campus -- C Building 406 (4th floor)

This course is ONLINE fall 2020 (due to COVID-19)
→ So, email me.

Meet your Professor

2018 US Open

→ USAian, raised in Europe

→ Education Background:
- Computer Science (Robotics, Artificial Intelligence)
- Cognitive Science (Developmental, Linguistic)
- Neuroscience (especially computational)

Ultimate Frisbee "Osaka Spirits"

→ Education etc.
- Ph.D., predocs: Indiana University, Tufts University
- Postdoc: National Institute for Physiological Sciences
- Now: Asst. Professor @ Kyoto University

<u>Hobbies</u>
Ultimate Frisbee
Cycling
Skiing
Reading...

Me, sister, mom @ Patagonia

What is Medical Psychology?

Problem 1: Traditionally, *psychology* has focused only on “mind”

Problem 2: Traditionally, *medicine* has focused only on “body”

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- But, we know the “mind” affects the body based on health-related behavior (tooth brushing, smoking)

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Medical Psychology addresses these topics

Medical Psychology Topics

What is contained in “Medical Psychology”?:

1) Psychological concepts relevant for medicine, health and healthcare

2) The link between psychological and somatic (body) processes

3) Health-related behavior

4) Psychological interventions to modify behavior and improve health

5) Embodied Cognition

Cognition is dependent upon features of the physical body of the agent.

Course Schedule and Grading

Unit	Date	Content
1	2020/10/02	Introduction to Medical Psychology
2	2020/10/09	Psychological tests and psychophysiology
3	2020/10/16	Intelligence (IQ) and learning
4	2020/10/23	Personality
5	2020/10/30	Sleep
6	2020/11/06	Emotions LIVE SESSION
7	2020/11/13	Psychological stress and its role in health and disease
8	2020/11/27	Post-traumatic stress-disorder, anxiety, and phobia
9	2020/12/04	Chronic pain
10	2020/12/11	Depression and suicide LIVE SESSION
11	2020/12/18	Substance abuse and dependence
12	2020/12/25	Placebo and nocebo
13	2021/01/08	Behavioral intervention LIVE SESSION
14	2021/01/22	Feedback (personal)
15	2021/01/29	Feedback (optional LIVE SESSION)

Grading

(a) 40% : 10 short tests on PANDA (not every lecture has a quiz)

→ due 2 weeks after lecture

(b) 30% : Live Zoom Session (Attendance and Preparation)

→ You will be called on 1 time during semester to give your answer

(c) 30% : Final Project (1-2 pages on a medical psychology topic)

→ due 22 Jan 2021

Schedule

Lectures

I will upload lecture slides (like this one) with a link to a youtube video of the lecture. Watch the lecture and complete the lecture quiz (if there is one) by 2 weeks after the date the lecture is initially uploaded.

Live Sessions

At the class time (13:00 PM Friday) we will have 3 live sessions (11/06, 12/11, 01/08). I will upload questions to think about – you should prepare responses.

An Example: Exercise and Memory

Does exercise make you study better for exams?

Does eating healthy make you do better on exams?

Exercise and Memory

Report

Current Biology

Physical Exercise Performed Four Hours after Learning Improves Memory Retention and Increases Hippocampal Pattern Similarity during Retrieval

Highlights

- Performing aerobic exercise 4 hr after learning improved associative memory
- Exercise at this time also increased hippocampal pattern similarity during retrieval
- Exercise performed immediately after learning had no effect on memory retention
- Exercise could have potential as a memory intervention in educational settings

Authors

Eelco V. van Dongen, Ingrid H.P. Kersten, Isabella C. Wagner, Richard G.M. Morris, Guillén Fernández

Correspondence

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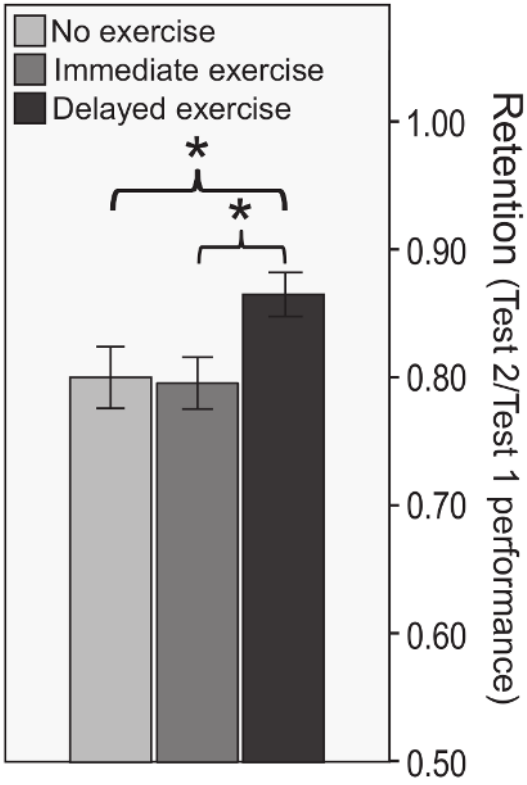
In Brief

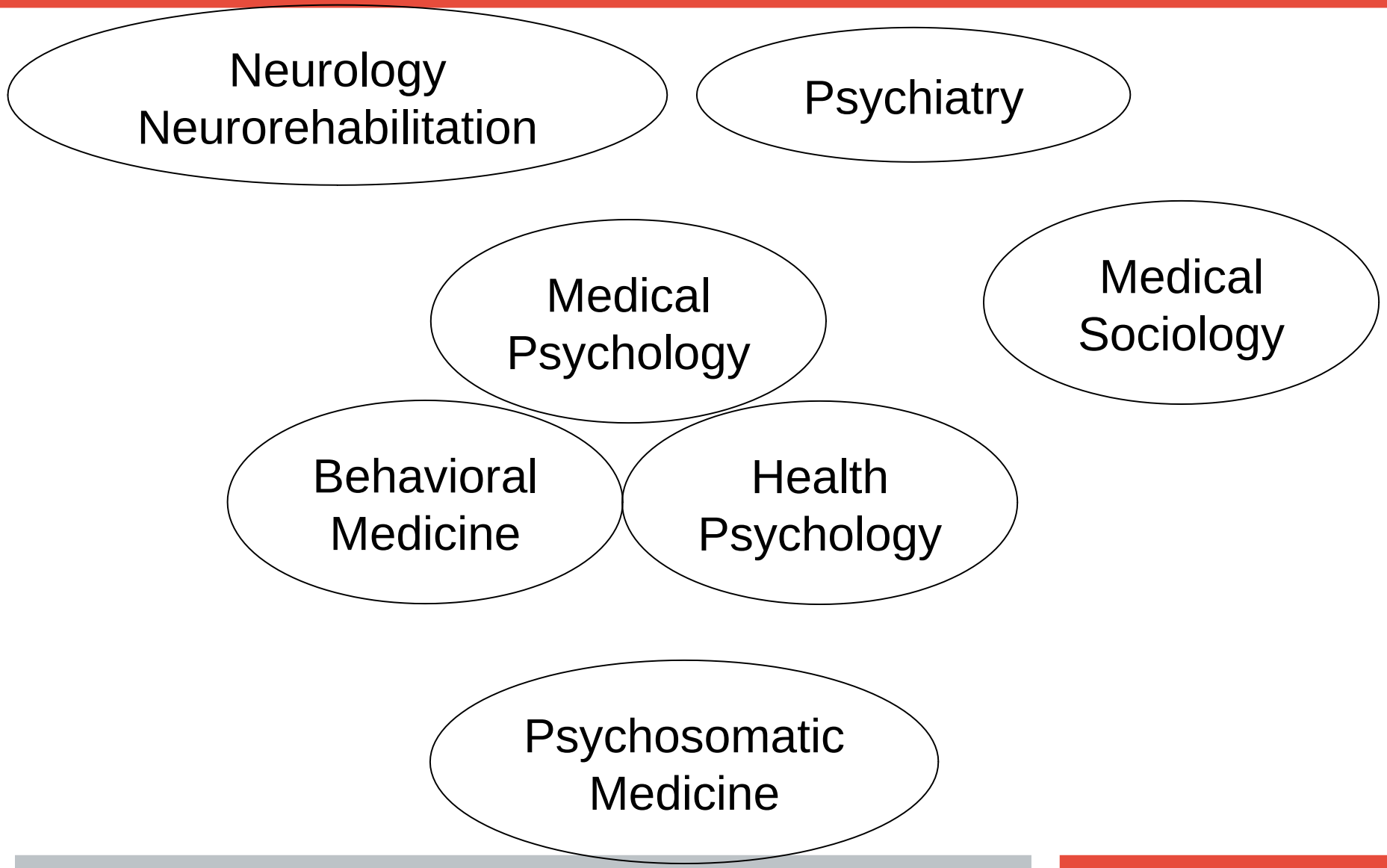
van Dongen et al. show that physical exercise performed 4 hr, but not directly, after learning improves long-term memory in humans. Such exercise was also associated with higher consistency in hippocampal activation during memory



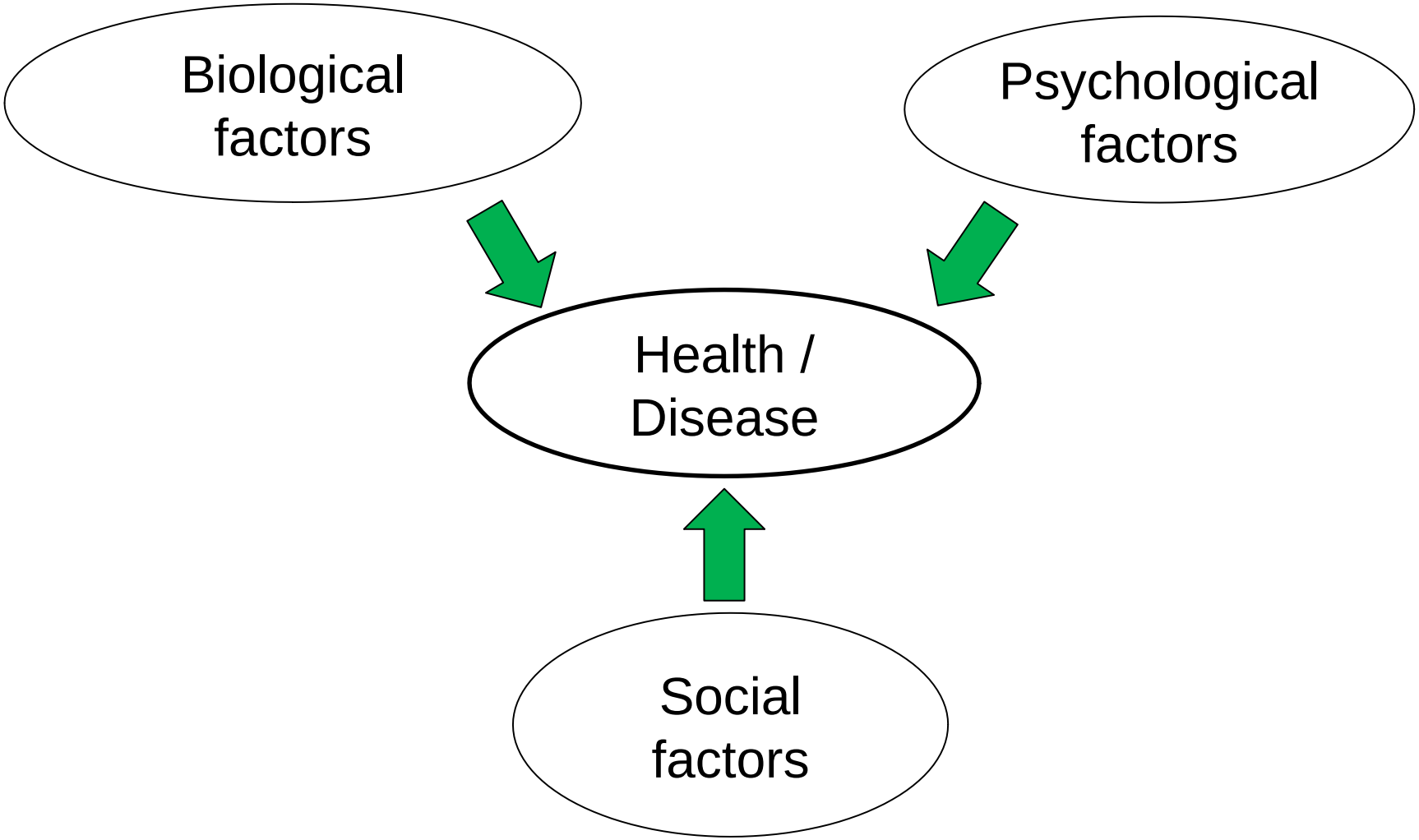
Better memory retention if you exercised 4 hours after learning. Similar (worse) retention if you don't exercise, or if you exercised immediately after studying.

Weird. What causes this? Lots of possible factors…

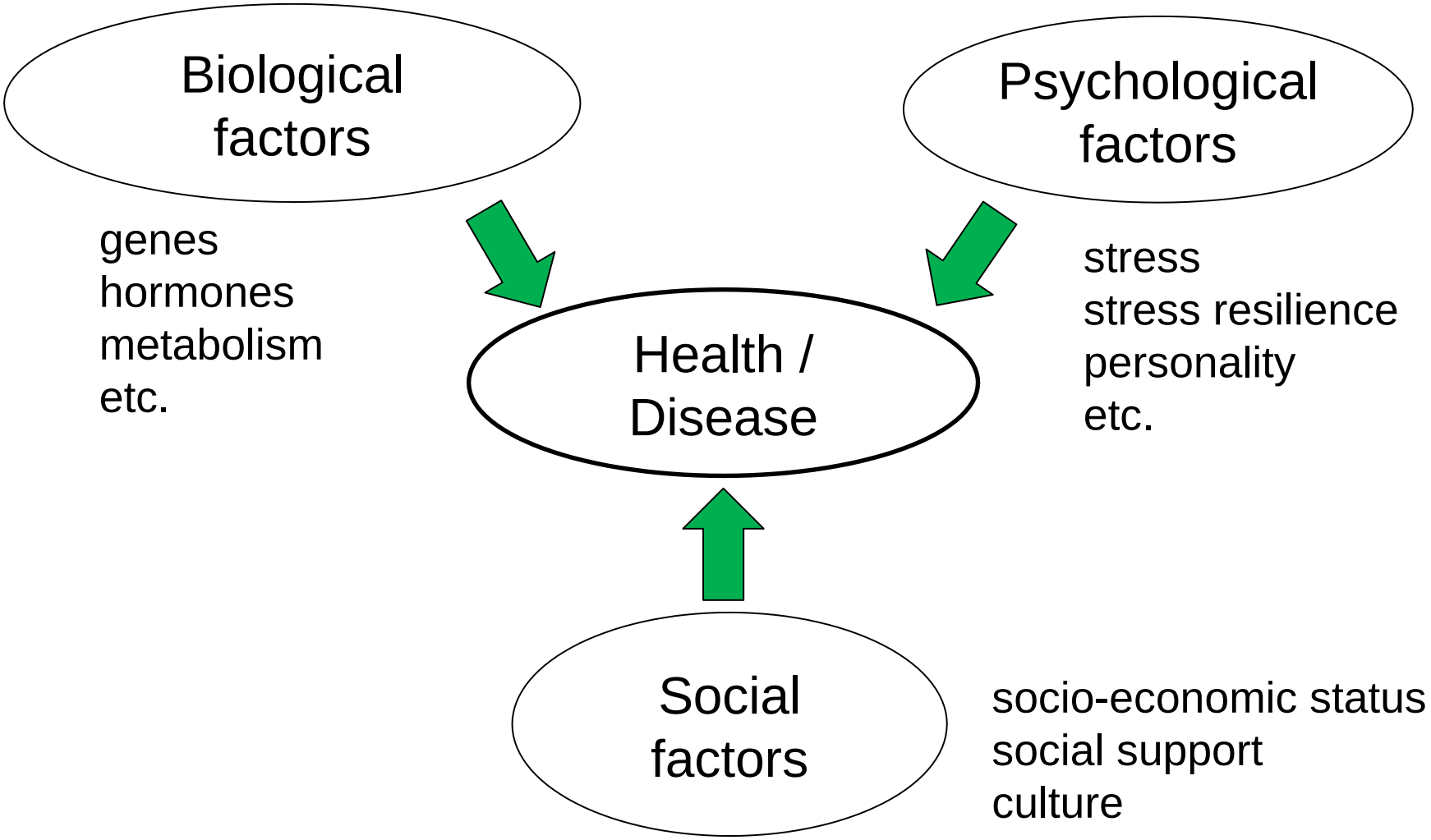
Fields related to Medical Psychology



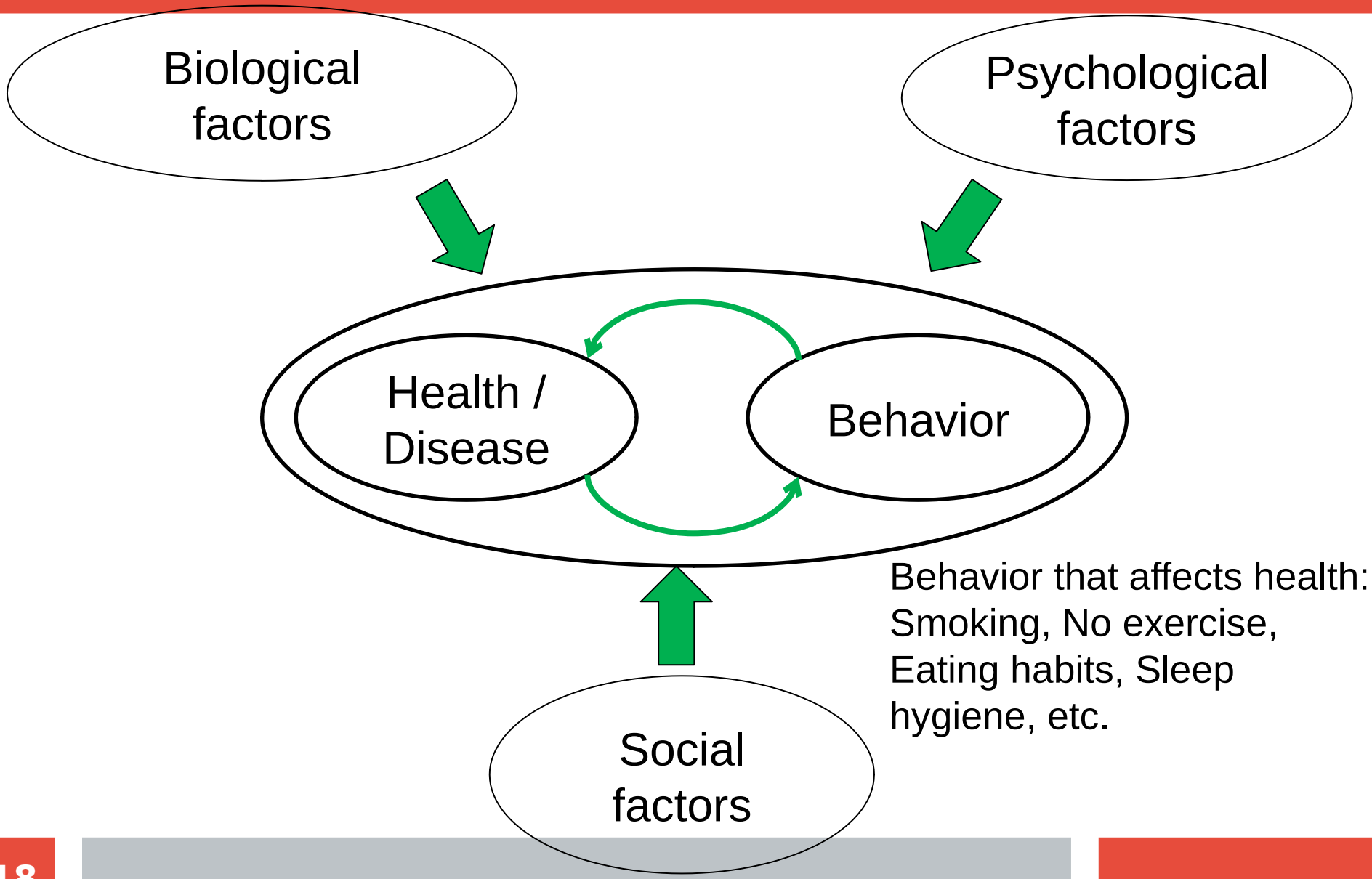
Biopsychosocial approach



Biopsychosocial approach



Biopsychosocial



Behavior that affects health: Smoking, No exercise, Eating habits, Sleep hygiene, etc.

History of Medical Psychology

Situation in Germany:
Medical Psychology became part of the mandatory medical (pre-clinical) curriculum in 1970 (with Medical Sociology).

Situation then:
1) Focus on biological factors

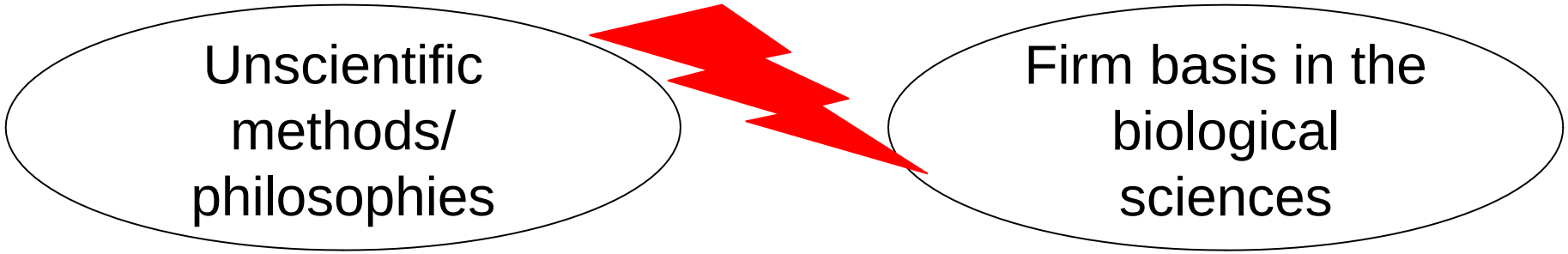
2) Authoritarian style
in university education

Prof.Dr. Ferdinand Sauerbruch (famous surgeon)

Medical Psychology caused by a break in Psychiatry?

George L. Engel, Science, 1977:

Psychiatry is divided



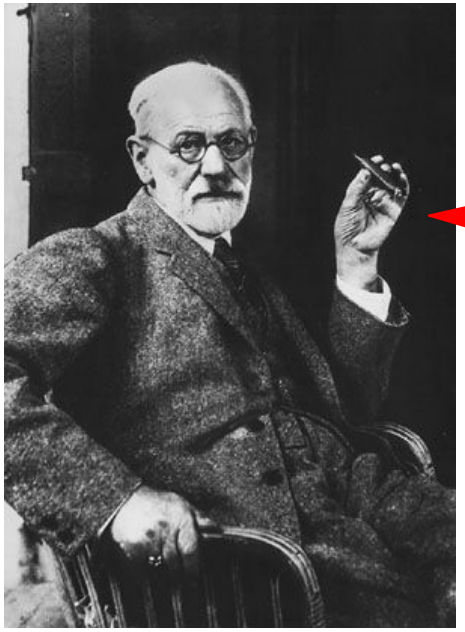
Engel: All medicine (not only Psychiatry) is in crisis and should take into account biological as well as psychological and social science.

Medical Psychology caused by a break in Psychiatry?

Unscientific methods:

Psychoanalysis strong in the 1970s, still strong in Psychiatry and Psychosomatic Medicine.

Why unscientific?



Sigmund Freud
1856-1939

Karl Popper
1902-1994

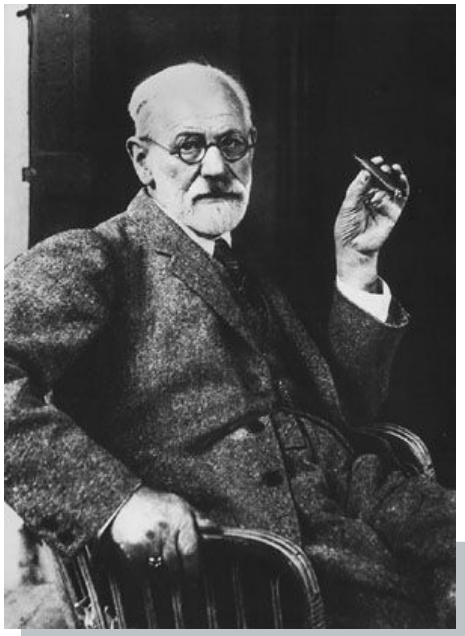
Psychoanalysis (1890s~)

Psychoanalysis (and psychodynamic approaches)

assumes the reason for adult neuroses (psychological disease)
in early childhood experiences with interpersonal relationships (parents!).

Unconscious drives influence our behavior and thoughts.

These drives are threatening to us (because of the way we were brought up), so defense mechanisms keep them from entering our consciousness.



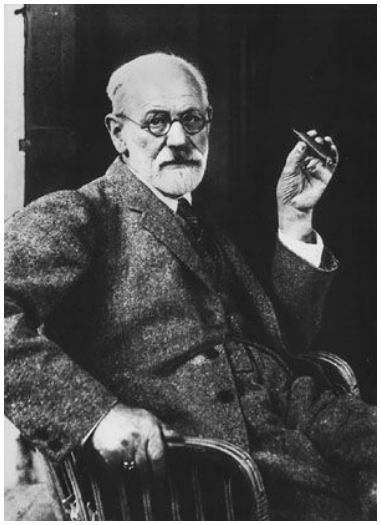
This can cause trouble, so psychoanalysis aims at making the unconscious, irrational drives conscious and thus susceptible to deliberate modification.

The (scientific) problem with psychoanalysis

Karl Popper saw psychoanalysis as a perfect example of unscientific theories.

They cannot be falsified…

Think of repression: either you are aware of an irrational drive and express it, or you are not aware but still have it, but it is repressed or turned into its contrary…

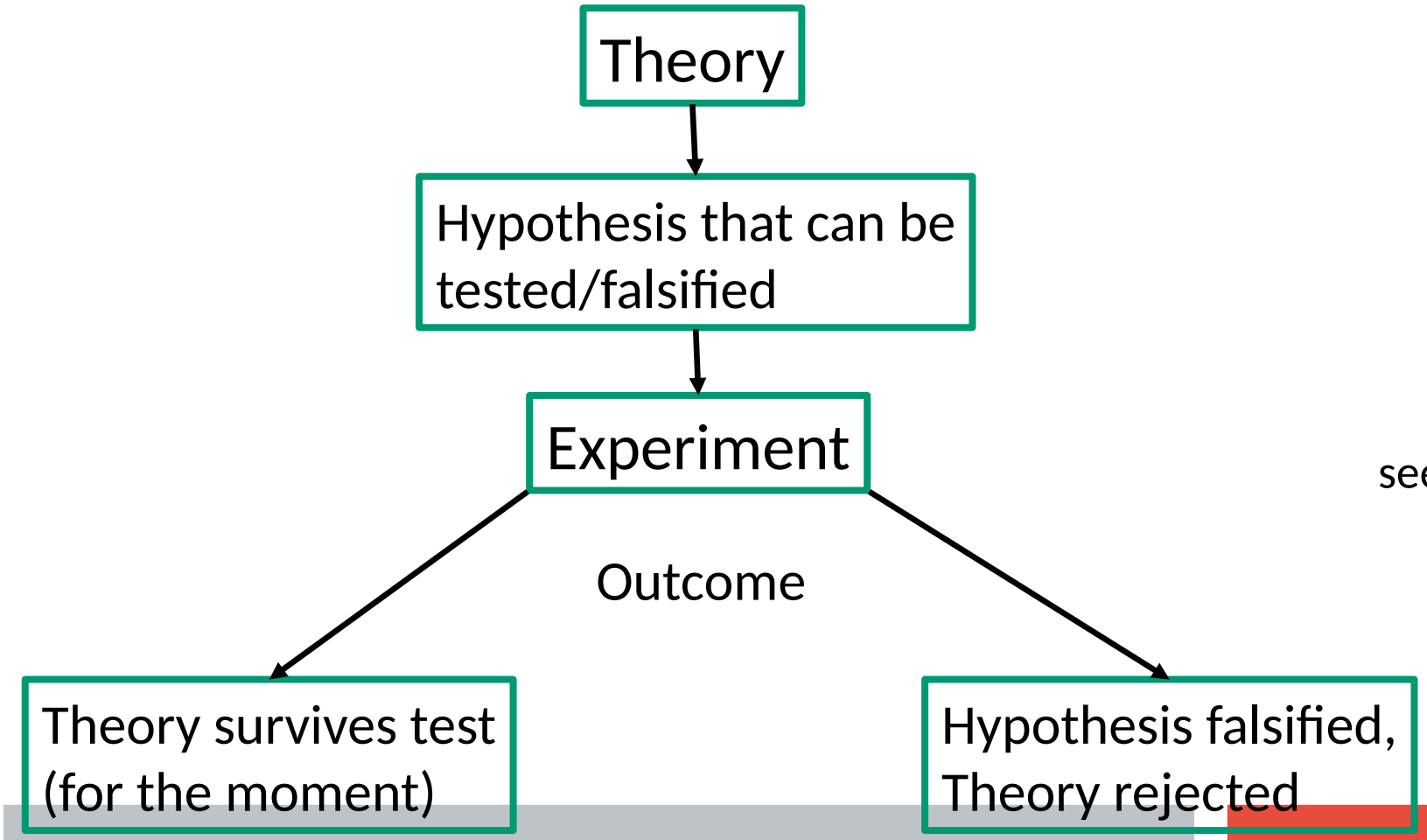


Sigmund Freud

Karl Popper

Scientific Method

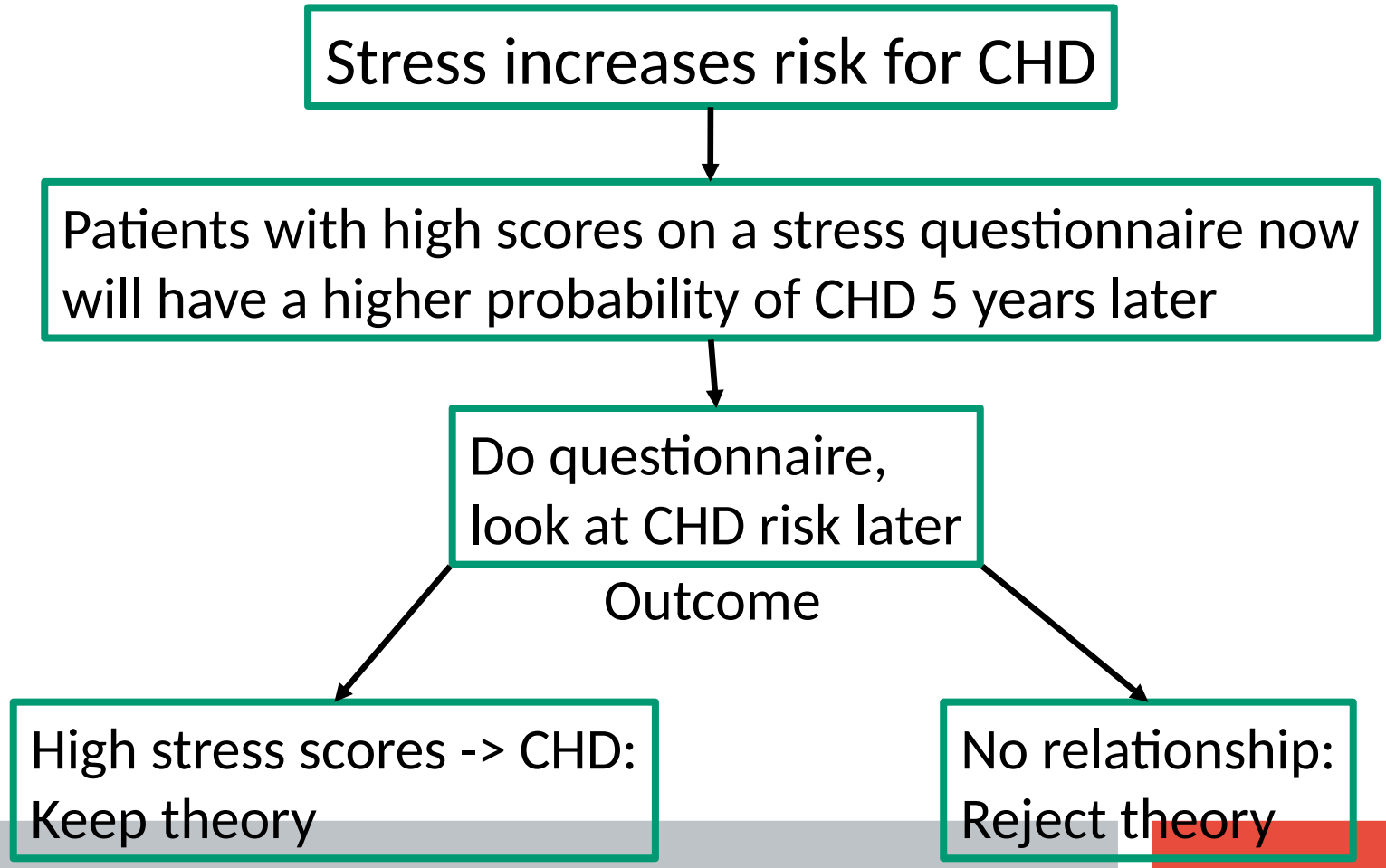
Can we use the scientific method to investigate the psychosocial factors that affect health?



see Karl Popper

Scientific Method
Example: Coronary Heart Disease (CHD)

For example: Is there a relationship between stress and higher risk for coronary heart disease (CHD)?



Behaviorism (B.F. Skinner, 1950~)

Scientific investigation of learning in animals led to behaviorism.
The focus is on observable behavior.
Behavior is understood as a product of learning experience.

Behavior therapy: psychological disorders are a maladjustment due to learning experience -> relearning/extinction of undesired behavior by behavior therapy.

Burrhus F. Skinner (1904-1990)

Biofeedback

We can measure psychological processes with physiological markers: heart rate increase, sweat secretion, muscle tone, brain activity.

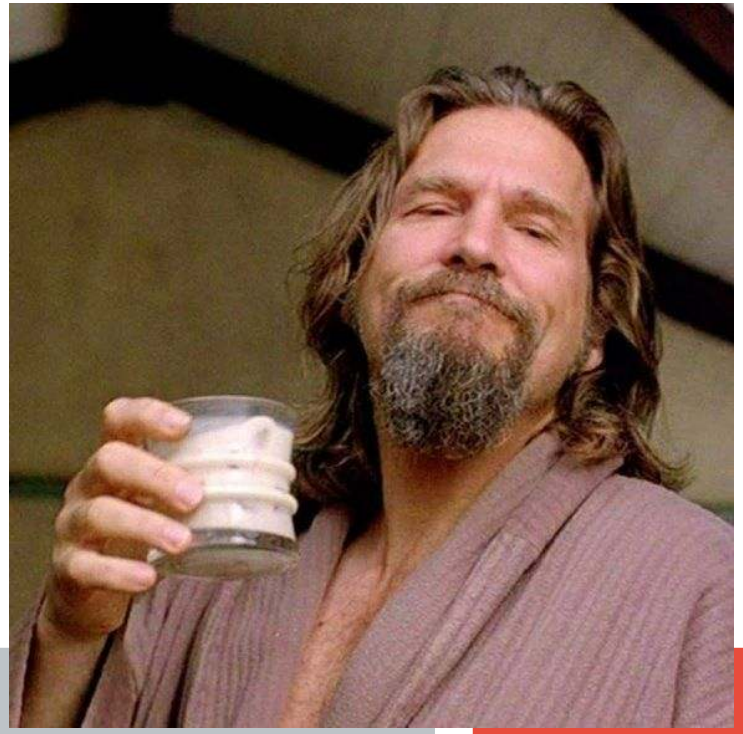
These measurements can be shown to the patient and the patient can learn to influence them.

- Stress-reduction
- Decrease muscle tone to improve chronic back pain
- Change brain rhythms to avoid epileptic fit
- Change brain activity to improve attention-deficit/hyperactivity disorder

The purpose of medical psychology

Using the scientific method to understand the influence of psychological factors on health and disease.

→ To improve public health and quality of life



Example: Oral Hygiene

OPEN ACCESS Freely available online

PLoS one

Improving Oral Hygiene Skills by Computer-Based Training: A Randomized Controlled Comparison of the Modified Bass and the Fones Techniques

Daniela Harnacke[1], Simona Mitter[1], Marc Lehner[1], Jörn Munzert[2], Renate Deinzer[1]*

1 Institute of Medical Psychology, University of Giessen, Giessen, Germany, **2** Institute of Sports Sciences, University of Giessen, Giessen, Germany

Abstract

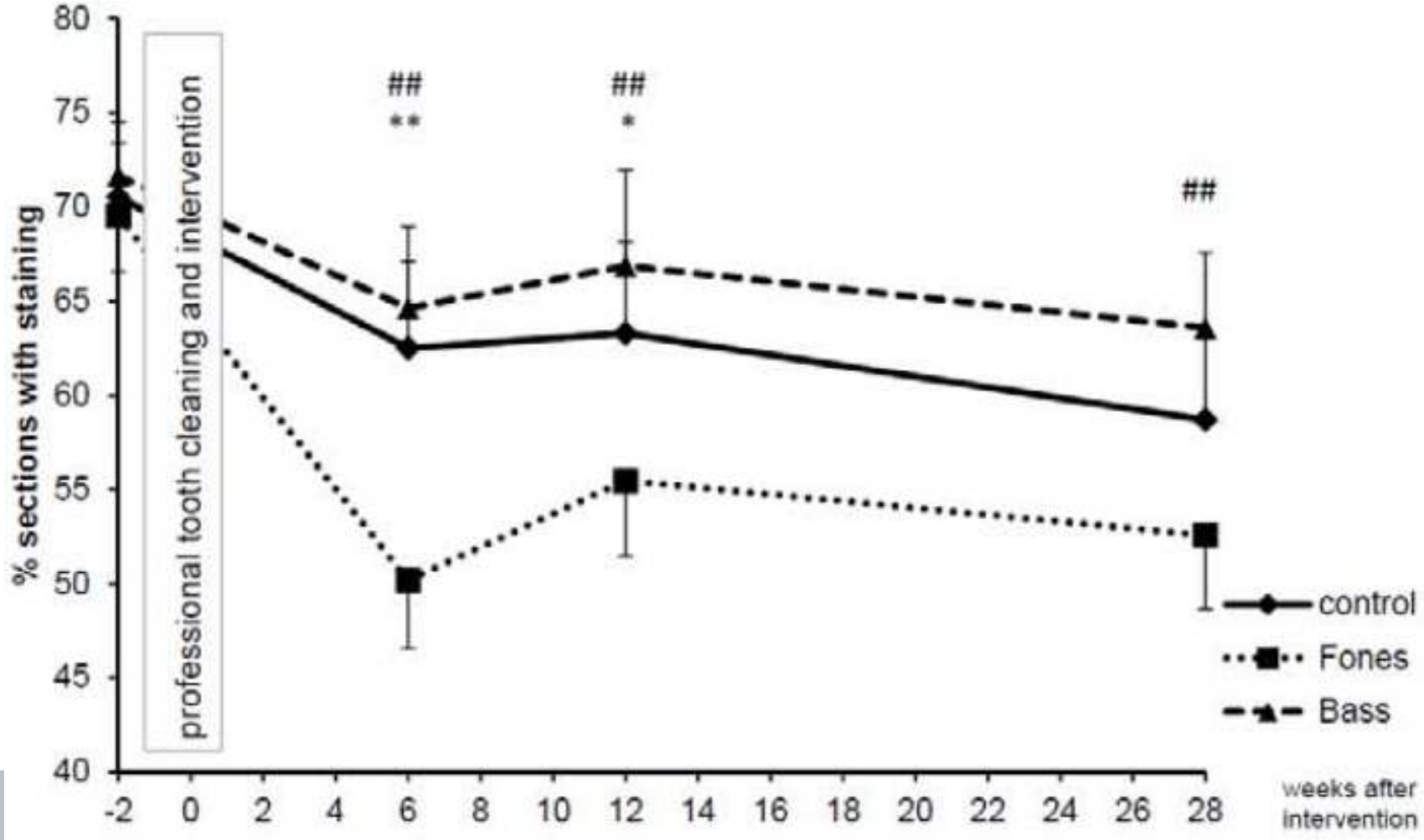
Background: Gingivitis and other plaque-associated diseases have a high prevalence in western communities even though the majority of adults report daily oral hygiene. This indicates a lack of oral hygiene skills. Currently, there is no clear evidence as to which brushing technique would bring about the best oral hygiene skills. While the modified Bass technique is often recommended by dentists and in textbooks, the Fones technique is often recommended in patient brochures. Still, standardized comparisons of the effectiveness of teaching these techniques are lacking.

Methodology/Principal Findings: In a final sample of n = 56 students, this multidisciplinary, randomized, examiner-blinded, controlled study compared the effects of parallel and standardized interactive computer presentations teaching either the Fones or the modified Bass technique. A control group was taught the basics of tooth brushing alone. Oral hygiene skills (remaining plaque after thorough oral hygiene) and gingivitis were assessed at baseline and 6, 12, and 28 weeks after the intervention. We found a significant group×time interaction for gingivitis ($F(4/102) = 3.267$; $p = 0.016$; $\varepsilon = 0.957$; $\eta^2 = 0.114$) and a significant main effect of group for oral hygiene skills ($F(2/51) = 7.088$; $p = 0.002$; $\eta^2 = 0.218$). Fones was superior to Bass; Bass did not differ from the control group. Group differences were most prominent after 6 and 12 weeks.

Conclusions/Significance: The present trial indicates an advantage of teaching the Fones as compared to the modified Bass technique with respect to oral hygiene skills and gingivitis. Future studies are needed to analyze whether the disadvantage of teaching the Bass technique observed here is restricted to the teaching method employed.

Oral Hygiene

→ More effective tooth brushing after computer-based explanation of Fones technique compared to Bass or control.

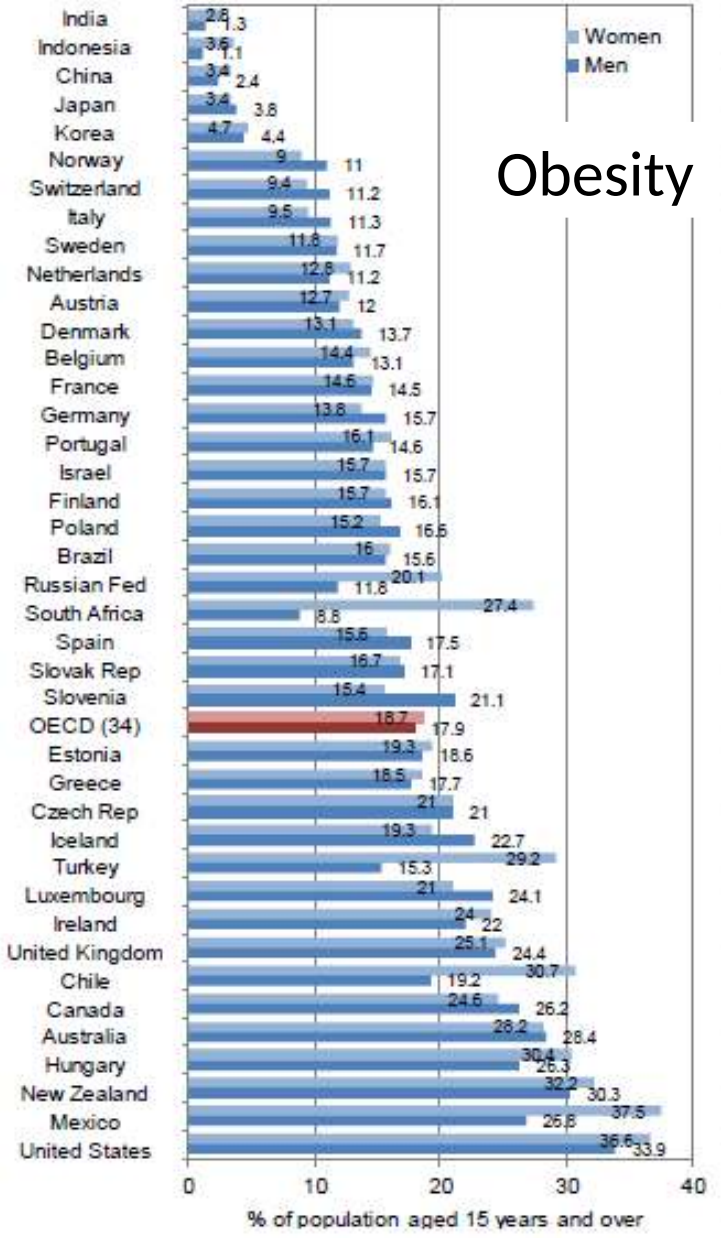


Example: Obesity

Example: Overweight
& Obesity

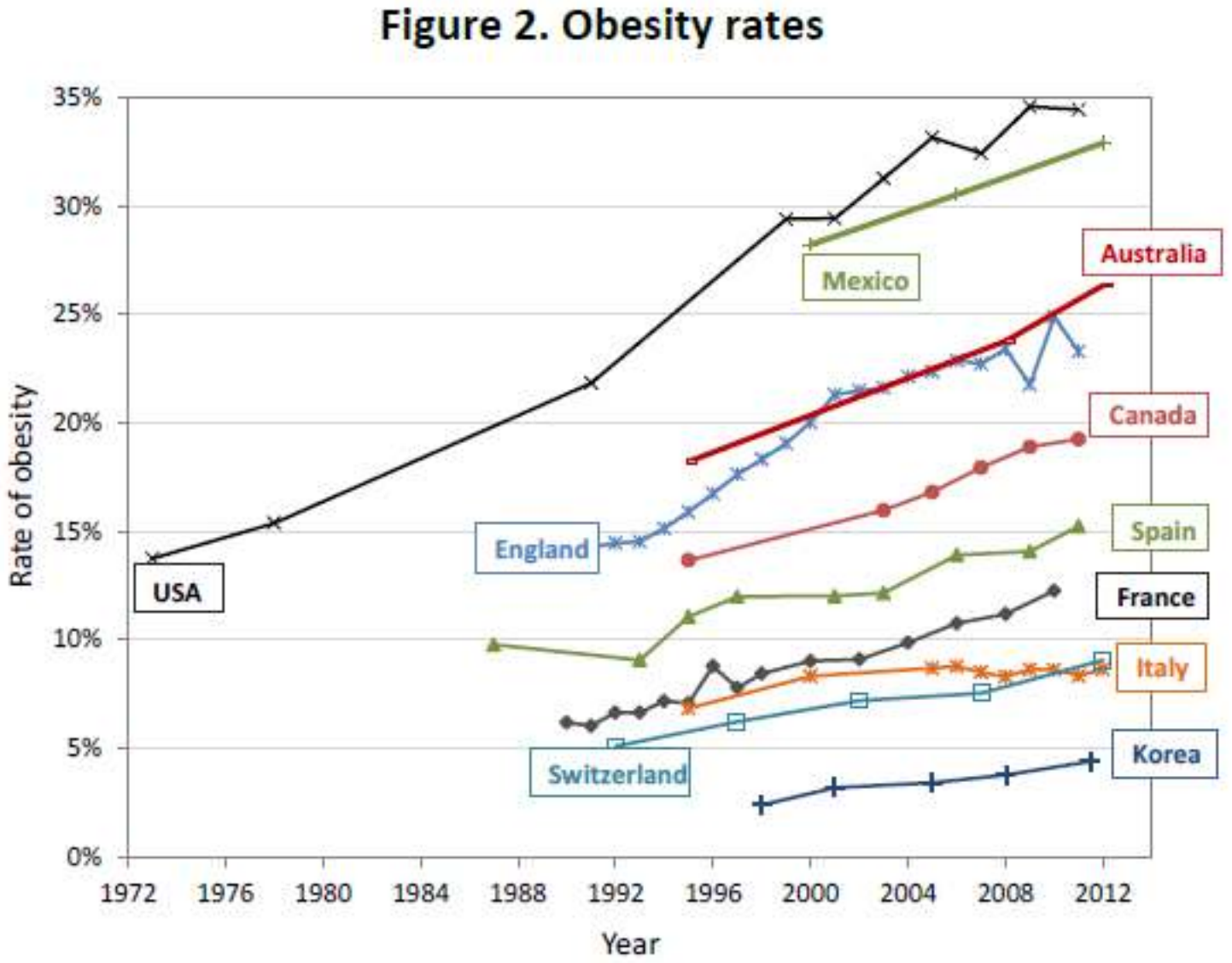
Overweight: BMI>25
Obesity: BMI>30

BMI (body mass index) =
Body Weight[kg] / Body Height^2 [m^2]



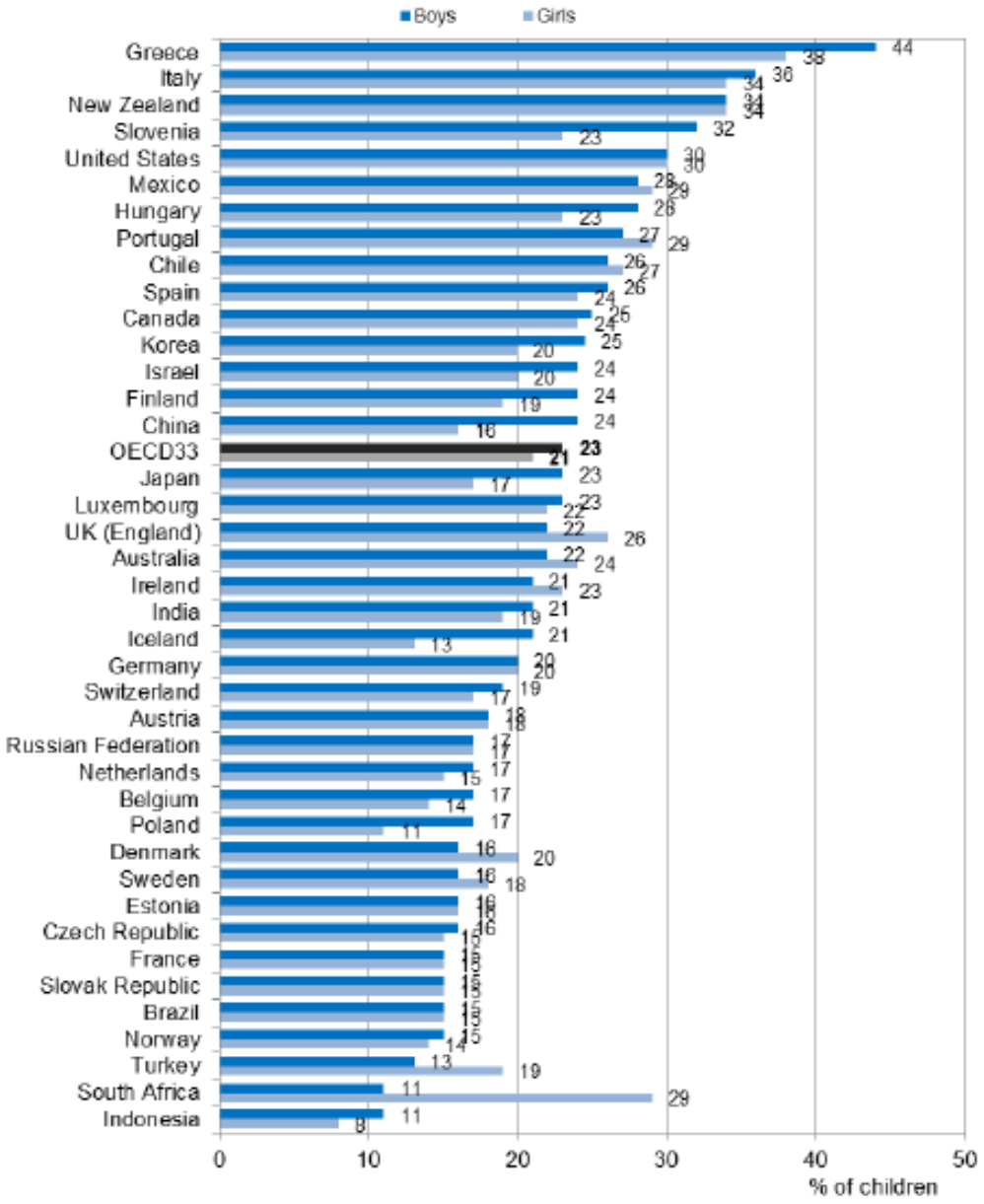
OECD, 2012

Obesity Increasing



OECD, 2012

Obesity in Children



Overweight & Obesity in children 5-17 years

OECD, 2010

Obesity:
What can Medical Psychology do?

Overweight and obesity are due to:

"an increased intake of energy-dense foods that are high in fat; and an increase in physical inactivity due to the increasingly sedentary nature of many forms of work, changing modes of transportation, and increasing urbanization. "

"Raised BMI is a **major risk factor** for non-communicable diseases such as:
cardiovascular diseases (mainly heart disease and stroke), which were the leading cause of death in 2012;
diabetes;
musculoskeletal disorders (especially osteoarthritis - a highly disabling degenerative disease of the joints);
some cancers (endometrial, breast, and colon)."

The problem with child overweight/obesity is that these individual are likely to stay obese into adulthood and develop non-communicable diseases.

“Opposite” problem: Anorexia

Problem for society: Anorexia

Distorted body image often observed in anorexics (“I am too fat, I must not eat and exercise more”)

Is the fashion industry to blame?

Isabelle Caro (1982-2010)

London fashion week

Smoking...

WHO

Example: Smoking

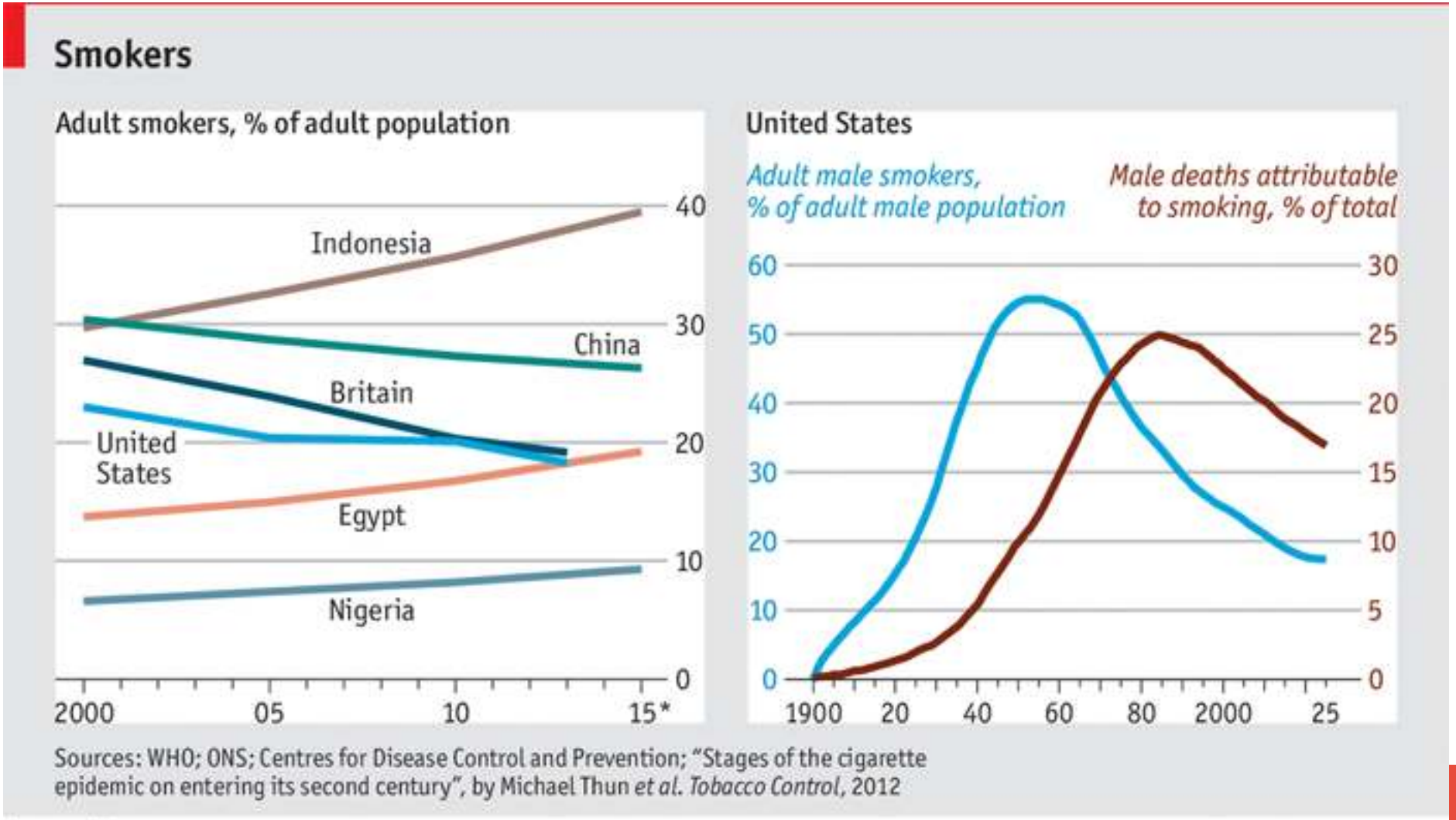
Smoking is a health problem caused by behavior.

kills ~6million people world-wide
(600,000 by second-hand smoke)

-> lung cancer, other types of cancer,
coronary heart disease, stroke

Policies to reduce smoking

Counter measures: public banning, taxes, warnings, cessation help (therapy/medication)



Summary

In Medical Psychology, you will learn about the various factors that affect health and behavior:

-Biological

-Psychological/Neural

-Social

You will learn major behaviors that affect health, and strategies used to address these behaviors.

I also teach:
Neuroscience B (Friday 1630-1800)

Motivation
Learning
Memory
Spatial memory and navigation
Executive functions and planning
Emotions
Reproductive behavior
Communication
Language / Language disorders
Social interaction
Evolution and development
Neurological and psychiatric disorder
Behavioral treatment strategies

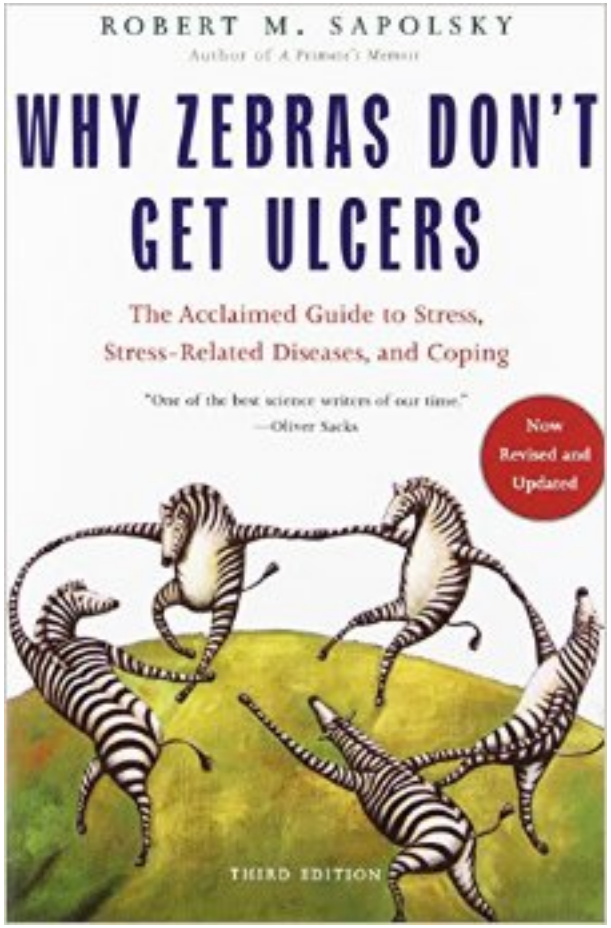
→ Some overlap with this course, but:

Medical psychology looks at what psychological knowledge can do for health.

Behavioral Neuroscience looks into the neural mechanisms of behavior.

Literature (not required)

Robert M. Sapolsky (2004):
Why zebras don't get ulcers.



"We study hard to get admitted to a top college to get a good job to get into the nursing home of our choice."